

Title: Gene expression profiles and signaling events in formation of the soybean cyst nematode feeding structure

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Abstract:

Over the past several years we have identified multiple genes for cell wall modifying proteins that are up-regulated during soybean cyst nematode (SCN) infection of soybean roots. A polygalacturonase (PG11a) was found to be highly up-regulated during SCN infection and was used to prepare transgenic soybean expressing GUS from the PG11a promoter to substantiate SCN-specific up-regulation and characterize cell-specific expression during SCN infection and other plant developmental processes. In addition, semi-quantitative RT-PCR (QPCR) was used to examine the gene expression patterns for 32 cell wall modifying proteins in several developmental and environmentally regulated processes as a means to identify common signaling compounds that might be co-opted by SCN for successful colonization of soybean roots. Of particular interest among the different tissues examined were similarities between SCN infection and petiole abscission. Signaling compounds that influence abscission in Arabidopsis and other plants are ethylene, auxin, and the IDA peptide and its interacting partner HAESA, an LRR receptor-like kinase. To examine a potential role for these regulatory events in soybean abscission and in SCN infection orthologous genes were identified in soybean and gene-specific primers prepared for ACC synthases (ethylene), GH3 (auxin), IDA-like and HAESA-like genes and the gene expression patterns for these regulatory enzymes and proteins characterized by QPCR. In addition, we've identified a conserved sequence motif (SCNbox1) in several of the gene promoters for genes that are up-regulated during SCN infection.